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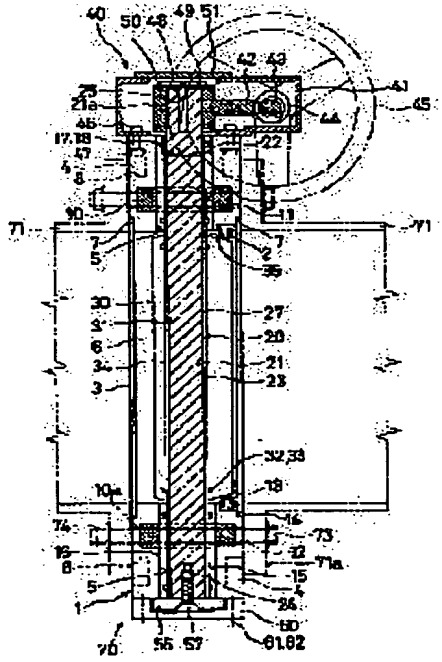
(54) BUTTERFLY VALVE

(57)Abstract:
PURPOSE: To dissolve the corrosion of a valve casing by forming this valve casing of a ring part with a seat ring mounting ring groove formed at the inner periphery, and valve stem supporting parts provided integrally in symmetry at two places, displaced by a specific angle, of the ring part, using fiber reinforced resin.
CONSTITUTION: A valve casing 1 manufactured of fiber reinforced resin (FRP) is formed of a ring part 3 with a seat ring mounting ring groove 2 formed at the inner periphery, and valve stem supporting parts 4 positioned protruding vertically outward from two places, displaced by 180° , of the ring part 30. A radial through hole 5 is formed at both valve stem supporting parts 4. A seat ring 15 to be mounted to the ring groove 2 is made of rubber, and fixed to the ring part 3 by filling epoxy resin serving as adhesive 14 in the ring groove 2 in the state of the outer peripheral side part of the seat ring 13 being fitted into the ring groove 2. A valve stem 20 insertable through between both resin metals 15 is formed of a core body 21 with an operating part 21a added to the upper end by welding (22), and an outer layer part 23 integrated with the outer periphery of the core body 21.



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CLAIMS

[Claim(s)]
[Claim 1] The ring section in which the valve box formed the circular sulcus for seat ring wearing in inner circumference, 180 of this ring section While it is symmetrical with two places which carried out degree displacement, and fiber strengthening resin constitutes the valve rod supporter formed in one and forming a radial through tube in both the valve rod supporter Inner fitting of the tubed resin metal is carried out to these through tubes. The valve rod which can be freely inserted in between both resin metal The butterfly valve characterized by equipping said circular sulcus with the seat ring which the periphery sealing surface of the valve element which closed can contact freely while unifying and forming the outer layer section by fiber strengthening resin in the periphery of a metal axis and uniting the valve element made of fiber strengthening resin with the pars intermedia of this valve rod.
[Claim 2] The butterfly valve according to claim 1 characterized by preparing the insertion nut for piping connection in a valve rod supporter.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]

[Industrial Application] This invention relates to the butterfly valve used arranging into piping of the pipeline who sends various kinds of liquids, such as sewage and seawater.

[0002]

[Description of the Prior Art] Conventionally, as this kind of a butterfly valve, the configuration looked at by JP,1-38376,Y, for example is offered. That is, it could join freely together and this conventional butterfly valve constituted casing (valve box) with the casing-upper half and casing lower half of symmetry structure, and it has attached the valve element between the inner edges of a valve stem while it prepares the valve stem of the vertical pair which penetrates a casing-upper half and casing lower half, and is located on a common revolving-shaft alignment. the flange for connection for furthermore making connection with other piping in the both ends of a casing-upper half and casing lower half -- a collar -- it forms in one by the **.

[0003] And it is supporting free [rotation] through the seal object which is located in the outside of the resin metal which attached the valve stem in the valve-stem penetration section of casing with the resin (an epoxy resin and polyurethane resin) pressed fit in the periphery section at the time of an assembly, and this resin metal, and has an O ring. While arranging a rubber seal plate in the outside of a seal object furthermore, the pressure plate arranged in the outside of a rubber seal plate is bound tight to a casing side, and immobilization is made free. Moreover, the resin lining which consists of the strengthening resin (FRP) which was inherent on the periphery of a valve stem and the outskirts of the valve-stem penetration section of casing in strengthening fiber, an epoxy resin, acrylic resin, polyester resin, etc. is constructed.

[0004]

[Problem(s) to be Solved by the Invention] According to the above-mentioned conventional butterfly valve, when it forms by carrying out the laminating of the thin resin lining to an inside or external surface by manufacturing a casing-upper half and

casing lower half with metals, such as iron, therefore breakage arises in a resin lining in external force, fluid pressure, etc., a problem arises to a life -- iron corrodes. Moreover, connection with other piping is made by making a bolt nut act between the flanges and the flanges for connection of a butterfly valve which were formed in this piping, and many bolt nuts are needed for both sides in this case, respectively. Moreover, in the accident from which the bolt and the nut were cut, both these bolts and a nut fly and it is easy to cause the dangerous situation.

[0005] The place made into the purpose of this invention is in the point of offering the butterfly valve which can make connection with other piping safely with a small number of fastener while being able to make a valve box hard to corrode.

[0006]

[Means for Solving the Problem] That the above-mentioned purpose should be attained the butterfly valve of **** 1 invention The ring section in which the valve box formed the circular sulcus for seat ring wearing in inner circumference, 180 of this ring section While it is symmetrical with two places which carried out degree displacement, and fiber strengthening resin constitutes the valve rod supporter formed in one and forming a radial through tube in both the valve rod supporter Inner fitting of the tubed resin metal is carried out to these through tubes. The valve rod which can be freely inserted in between both resin metal While unifying and forming the outer layer section by fiber strengthening resin in the periphery of a metal axis and uniting the valve element made of fiber strengthening resin with the pars intermedia of this valve rod, said circular sulcus is equipped with the seat ring which the periphery sealing surface of the valve element which closed can contact freely. And the butterfly valve of **** 2 invention has prepared the insertion nut for piping connection in the valve rod supporter.

[0007]

[Function] According to the above-mentioned configuration of

**** 1 invention, passage can be intercepted by making the periphery sealing surface of a valve element contact in the perimeter to a seat ring. And by rotating a valve rod, the include angle of the request of the valve element of one to this valve rod is made to open, and a flow rate can be adjusted. Since this valve box is a product made of fiber strengthening resin even if a blemish is attached to a valve box with external force, fluid pressure, etc. during such use, corrosion etc. is not generated. Moreover, according to the configuration of **** 2 invention, connection of piping of the pair to a butterfly valve can be made by making the bolt which it let pass from the outside to the flange for connection of one piping screw in an insertion nut, and making a nut screw in the lobe of this bolt, after letting the bolt which came out to the opposite side pass to the flange for connection of piping of another side. A bolt seems and not to fly from screwing in an insertion nut, when the accident which a bolt and a nut fracture while in use occurs.

[0008]

[Example] One example of this invention is explained based on drawing below. 180 of the ring section 3 which 1 is the valve box manufactured with fiber strengthening resin (FRP), and formed the circular sulcus 2 for seat ring wearing in inner circumference, and this ring section 3 whenever -- having displaced -- two -- a place -- from -- the upper and lower sides -- outside -- a way -- projecting -- being located -- a valve rod -- a supporter -- four -- from -- becoming -- for example, it constitutes from really fabricating by centrifugal molding in the symmetry. And the radial through tube 5 is formed in both the valve rod supporter 4. The central through tube of said ring section 3 is formed in the passage 6 which can arrange a valve element (it mentions later.) freely, and the reentrant step 7 for equipping with ring-like grand rubber packing (sealant) opens an order side and an inside in the ring section 3 order side wide, and it is formed in it.

[0009] Said valve rod supporter 4 is a rectangle-like, from the each order side, the crevice 8 of a Uichi Hidari pair is formed

and the bolt insertion hole 9 which opens the inner of a crevice 8 to a way outside the upper and lower sides is formed. Furthermore, the insertion nut 10 is formed in the interior of both the valve rod supporter 4. Cylinder part 10a which these insertion nut 10 is manufactured in the shape of a rectangle block with a metal, and has in the center the penetration section 11 of the vertical direction which forms said through tube 5, and projects on both sides of the penetration section 11 at a cross direction, respectively is formed in one. The screw hole 12 is formed so that a these cylinder part 10a order end face may be exposed to the valve rod supporter 4 order side and it may pass along between cylinder part 10a of order. These screw holes 12 are formed in ring section 3 approach to said crevice 8.

[0010] Said circular sulcus 2 has the shape of a dovetail groove of inside disconnection, and is formed in the one side which shifted forward and backward to said through tube 5. The seat ring 13 with which this circular sulcus 2 is equipped is a product made of rubber, is in the condition which inserted the part by the side of that periphery in the circular sulcus 2, and is fixed to the ring section 3 by using as a binder 14 the epoxy resin injected into the circular sulcus 2. The contact of the periphery sealing surface (it mentions later.) of the valve element which closed is attained to the part by the side of the inner circumference of said seat ring 13.

[0011] The resin metal 15 by which inner fitting is carried out to said through tube 5 is formed in tubed with polypropylene, fluorine resin, etc., is processing the interface 16 with the inside of a through tube 5 by corona discharge, and is united with the valve rod supporter 4. And the concave 17 of inside disconnection is annularly formed in two places of the direction of an axial center (die length) of the resin metal 15, and wearing of O ring 18 is enabled at these concaves 17.

[0012] 20 is the valve rod which can be freely inserted in between both the resin metal 15, and is formed of the axis 21 which added actuation section 21a to upper limit by welding 22, and the outer

layer section 23 united with the periphery of this axis 21. That is, the axis 21 is manufactured with metal rods [being unprocessed (rough finishing)] (SS41 etc.), and reentrant formation of the screw hole 24 of the pair distributed to the lower limit to the axis axial center is carried out. Moreover, reentrant formation of the key seat 25 located on an axis axial center is carried out at actuation section 21a manufactured with the metal rod, and reentrant formation of the screw hole 26 of a pair is carried out further at the both sides of a key seat 25.

[0013] Said outer layer section 23 is manufactured in the shape of a pipe with fiber strengthening resin, is performing the manufacture by centrifugal molding, and has finished the front face finely. This outer layer section 23 is united with the axis 21 etc. by using as a binder 27 the epoxy resin which all of axes 21 were covered from said a part of actuation section 21a, and outer fitting was carried out, and was poured into face-to-face [which carried out phase opposite]. The amount of contractions of fiber strengthening resin will be absorbed with an epoxy resin in that case, with the outer layer section 23 can be fixed with a sufficient precision to an axis 21.

[0014] The valve element 30 united with the pars intermedia of said valve rod 20 is manufactured by discoid with fiber strengthening resin and resin concrete, and the through tube section 31 of the vertical direction is formed in the center section. And near the both ends of the through tube section 31, the concave 32 of inside disconnection is formed annularly and is enabling wearing of O ring 33 at these concaves 32. Said valve rod 20 is inserted in a valve element 30 through the through tube section 31, and is unifying the valve rod 20 and the valve element 30 by using as a binder 34 the epoxy resin poured in between the inside of the through tube section 31, and the outer layer section 23. If the leakage of the epoxy resin pressed fit is prevented with said O ring 33 and a valve rod 20 is covered from a valve element 30 in the case of this unification, two or more taper pins for baffles (not shown) are driven in. The

periphery of said valve element 30 is formed in the periphery sealing surface 35 which can contact said seat ring 13 freely when this valve element 30 closes.

[0015] An operating set 40 is arranged in said actuation section 21a side. The body 41 of this operating set 40 is a case-like, and has formed the worm gearing 42 of the letter of loss of teeth in that interior free [rotation] around the normal-axis alignment. And the body 41 had the actuation shaft 43 which can rotate freely around an axis-of-abscissa alignment, and it has formed the handle 45 in the outcrop of the actuation shaft 43 while it fixes to this actuation shaft 43 the worm gear 44 which gets into gear to said worm gearing 42. Said operating set 40 is laid from the upper part to the valve rod supporter 4 of a high order, and outer fitting of the worm gearing 42 is carried out to actuation section 21a in that case. And an operating set 40 is fixed to the valve rod supporter 4 by making the bolt 46 which covered said bolt insertion section 9 from the inside of a body 41, and it let pass from the upper part screw in the nut 47 located in said crevice 8.

[0016] Moreover, a key 48 is driven into said key seat 25 from the upper part, and a worm gearing 42 is united with the upper limit of a valve rod 20 in a hand of cut by fixing to a worm gearing 42 with the fasteners 50, such as a bolt, after making this key presser foot 49 contact the top face of a worm gearing 42, while attaching the key presser foot 49 outside the upper limit of a key 48. The key presser foot 49 is a ring-like, and is formed with the fiber strengthening resin plate here. In addition, a lid 51 is formed in the upper part of a body 41, and placing of a key 48, immobilization of the key presser foot 49, etc. are enabled by removing this lid 51.

[0017] The bolt 57 which said valve rod 20 falls out, the thrust flange 55 which can contact freely is formed in the inferior surface of tongue of the valve rod supporter 4 [for a stop and a seal] from the inferior surface of tongue of this valve rod 20, and the bolthole 56 formed in this thrust flange 55 lets it pass from a lower part, and can be freely screwed in said

screw hole 24 is formed. The thrust flange 55 is formed in the vertical side of fiber strengthening resin plate 55a by carrying out the laminating of the fluorine resin layer 55b here. And it is fixed to the valve rod supporter 4 by making the bolt 61 which the thrust flange 55 was covered, the covering object 60 which can contact the inferior surface of tongue of the valve rod supporter 4 freely was established, this covering object 60 covered said bolt insertion section 9 from the covering object 60, and it let pass from the lower part screw in the nut 62 located in said crevice 8. In addition, the covering object 60 is manufactured with fiber strengthening resin.

[0018] Hereafter, the assembly activity of a butterfly valve 70 is explained in the above-mentioned configuration. A valve box 1, a valve rod 20, the valve element 30, the key presser foot 49, the thrust flange 55, the covering object 60, etc. are manufactured by each ** here, and unitization of the operating set 40 is carried out separately. A valve element 30 is first inserted in in the passage 6 of a valve box 1, and the hole of the resin metal 15 is made to open the through tube section 31 of this valve element 30 for free passage. And a valve rod 20 is inserted from the upper part to the hole of the resin metal 15 of a high order (or low order). Then, a valve rod 20 will pass the through tube section 31 of a valve element 30 along the hole of a passage and the low-ranking resin metal 15 from the hole of the resin metal 15 of a high order.

[0019] Subsequently, while fixing the thrust flange 55 to the lower limit of a valve rod 20 through a bolt 57, after making this thrust flange 55 contact the inferior surface of tongue of the valve rod supporter 4, the wrap covering object 60 is made to fix the thrust flange 55. then -- or before this, the body 30 of an operating set 40 is fixed to the valve rod supporter 4 of a high order, and placing of a key 48, immobilization of the key presser foot 49, etc. are performed. When the optimal after letting a valve rod 20 pass in the through tube section 31 of a valve element 30 as mentioned above, both 20 and 30 unification is performed. That is, where ****** of the periphery

sealing surface 35 to a seat ring 13 is adjusted that it should equalize in the perimeter, an epoxy resin is poured in as a binder 34 between the inside of the through tube section 31, and the outer layer section 23, with the valve rod 20 and the valve element 30 are unified. In the case of this unification, said outer layer section 23 has finished the front face finely by centrifugal molding, will absorb the amount of contractions of fiber strengthening resin with an epoxy resin, with can fix a valve element 30 with a sufficient precision.

[0020] The piping 71 of a pair is connected to the butterfly valve 70 assembled as mentioned above. That is, a bolt 73 is screwed in through from an outside, and this bolt 73 is made to screw in the screw hole 12 of the insertion nut 10 to flange 71a for connection of one piping 71, where the reentrant step 7 is equipped with the ring-like grand rubber packing 72. And after letting the bolt 73 which came out to the opposite side pass to flange 71a for connection of the piping 71 of another side, expected piping connection can be made by making a nut 74 screw in the lobe of this bolt 73. In the pipeline formed as mentioned above, it is making the periphery sealing surface 35 of a valve element 30 contact in the perimeter to a seat ring 13, and passage 6 can be intercepted. And by rotating the actuation shaft 43 through a handle 45, and rotating a valve rod 20 through a worm gear 44 and a worm gearing 42, the include angle of the request of the valve element 30 of one to this valve rod 20 is made to open, and a flow rate can be adjusted.

[0021] In addition, even if a blemish is attached to a valve box 1 with external force in use, fluid pressure, etc., since it is a product made of fiber strengthening resin, this valve box 1 does not generate corrosion etc. A bolt 73 seems moreover, not to fly from screwing in the screw hole 12 of the insertion nut 10, when the accident which a bolt 73 and a nut 74 fracture while in use occurs.

[0022]

[Effect of the Invention] According to **** 1 invention of the above-mentioned configuration, it is hard to corrode and a valve

box can be formed, even if a blemish arises in external force, fluid pressure, etc., and it can improve a life. moreover, the accident from which according to **** 2 invention the insertion nut could be shared to piping of a pair, and the fastener for connection could be lessened, and the bolt was cut -- setting -- a bolt and nut **** -- things can be prevented and immobilization can be carried out to insurance.

[Translation done.]